

PATENT SPECIFICATION SHEET

Maximally Digitized Fractional-N Frequency Synthesizer and Modulator with Maximal Fractional Spurs Removing

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ABSTRACT OF THE DISCLOSURE

A fractional-N frequency synthesizer using the first order Delta-Sigma frequency discriminator which is composed of only a dual modulus frequency divider and a D flip-flop is used to replace the function of phase detector is disclosed. The invented structure is characterized by generating the feedback error signal indirectly from the output bit stream of said discriminator in such a way that the quantization noise contained in the bit stream is maximally canceled by comparing it with another bit stream generated by an accumulator digitally performing the first order Delta-Sigma modulation to the required fractional number, so that there is almost no discrete fractional spurs in the output spectrum of the synthesizer. Most other circuit of the synthesizer could be formed digitally so that high integration level and low noise performance could be achieved. Narrow or wideband phase or frequency modulation could also be conveniently added digitally with good accuracy.